OHIO ACADEMY OF SCIENCE NATURAL HISTORY FIELD TRIP
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A VISIT TO THE CLEVELAND MUSEUM OF NATURAL HISTORY, HISTORIC LAKE VIEW CEMETERY, AND EUCLID CREEK

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THE CLEVELAND MUSEUM OF NATURAL HISTORY

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INTRODUCTION

The purpose of this field trip is to acquaint the visitor with three important sites in the Cleveland area: The Cleveland Museum of Natural History in University Circle; historic Lake View Cemetery, which is located just to the southeast of University Circle; and Euclid Creek Reservation of the Cleveland Metroparks, located just a few miles to the east of the cemetery. Emphasis will be put on historic figures in the field of natural history. Stops in Lake View Cemetery are numbered.

THE CLEVELAND MUSEUM OF NATURAL HISTORY

The Cleveland Museum of Natural History traces its ancestry to a group of naturalists who met on Cleveland's Public Square in the 1800s (Hendrickson, 1962). The museum now consists of a large building located at 1 Wade Oval in Cleveland's beautiful University Circle area. There are about 12,000 m^2 of floor space in the current structure. The Museum is open to the public Monday through Saturday 10:00 AM until 5:00 PM and Sunday noon until 5:00 PM. It is closed major holidays. Call (216)231-4600 for more information. The Museum is a private, non-profit organization.

The Cleveland Museum contains large collections of biological, geological and cultural materials and a number of laboratories where these materials are preserved, prepared and studied. Some of the collections are among the largest in the state. While most collections were made subsequent to the Museum's founding in 1920, a few collections predate the founding. These include an assemblage of shells collected by Jared Potter Kirtland (1793-1877). One of the major halls of the Museum, the Museum's scientific journal *Kirtlandia*, and the Kirtlandia Society, one of the Museum's associated societies, are named in honor of this important early naturalist.

The newest permanent exhibition area of the Museum is the Reinberger Hall of Earth & Planetary Exploration. This hall was groundbreaking in its integration of geological and astronomical sciences. The exhibit includes many specimens (hands-on where practical), a mock-earthquake exhibit station along with a real seismograph, and many interactive stations. Using songs and video clips, one of the interactives tells the story of Ohio's greatest geological hits. Emphasis is on the drastic changes in Ohio's land- and seascapes over geologic time. The associated Wade Gallery of Gems & Jewels exhibits the Museum's collection of precious stones and jewelry.

Kirtland Hall exhibits many types of prehistoric organisms, including several outstanding specimens of fossil arthrodires and sharks selected from the Museum's world-famous collection of Late Devonian fish. There are also holotypes of two dinosaurs: the sauropod *Haplocanthosaurus delfsi* McIntosh and Williams, 1988, and the theropod *Nanotyrannus lancensis* (Gilmore, 1946). The *Nanotyrannus* specimen consists of a beautifully preserved, three-dimensional skull. The genus was established by Bakker et al. in 1988, and the specimen has subsequently been restudied by a number of scientists. CAT scans of *N. lancensis* have graced the pages of the journal *Science,* as well as high school textbooks.

A hall including a replica of the oldest known boat (the Ringler dugout, dated at 1600 B.C.; the actual specimen is preserved in a special box behind-the-scenes) from Ohio, as well as other archeological exhibits and an entranceway to the planetarium, connects Kirtland Hall with the Sears Hall of Human Ecology. Sears Hall contains cultural and biological specimens arranged by geographic area. Diverse habitats are represented, showing how humans have interacted with the natural world.

HISTORIC LAKE VIEW CEMETERY

The craving for immortality, common to all men, has ... led to the erection of a thousand granite monuments to mark the resting-places of private individuals, instead of the single greater one raised by some ancient autocrat to perpetuate his fame, while the common people lived and died like the beasts that perish.

John Strong Newberry
(1880, p. 114)

INTRODUCTION

Lake View Cemetery is a splendidly landscaped necropolis decorated with Victorian and more recent monuments. Within its sublimely melancholy boundaries one can find a wealth of stone monuments made of material quarried at many different sites and erected over a period of more than 130 years. It is one of a very few large, garden style cemeteries to be found in Ohio.

Influenced by large British gardens and eighteenth century French cemeteries, garden style cemeteries became popular in nineteenth century Britain and North America (Linden-Ward, 1989). Mt. Auburn Cemetery (1831) in Cambridge, Massachusetts, was the first garden style cemetery to be founded in the United States. It became the model for other such cemeteries, which were usually set on hilly sites outside of larger cities (Potter and Boland, 1992, p. 4). In Ohio, the establishment of Lake View Cemetery (1869) followed that of several other large garden style cemeteries: Akron's Glendale Cemetery (1839), Dayton's Woodland Cemetery (1841; see Sandy, 1992), Cincinnati's Spring Grove Cemetery (1845), and Columbus's Green Lawn Cemetery (1848). Toledo's Woodlawn Cemetery was be founded soon after Lake View Cemetery, in 1876. Lake View was designed by Adolph Strauch of Spring Grove Cemetery (Karberg, 1993, p. 4). Of all the Ohio garden style cemeteries, Lake View Cemetery, with its exquisite natural features, early horticultural connections, and numerous Victorian monuments, most closely resembles Mount Auburn Cemetery.

Early on, Lake View Cemetery was called "one of the most beautiful cemeteries in the West" (Johnson, 1879, p. 306). Lake View was originally outside of the city limits of Cleveland, but part of the cemetery was enveloped by the expanding city in 1892. The cemetery now comprises adjoining portions of Cleveland, East Cleveland, and Cleveland Heights.

Lake View Cemetery has long been known for its prominent deceased, including Cleveland's economic, political and social elite. This cemetery is the final resting place of mayors and robber barons, as well as the popular president, James A. Garfield (1831-1881), and Ray Chapman (1891-1920), the last major league baseball player to die as the result of a pitched ball. There are also graves of those who achieved fame for their intellectual and scientific work. These include the celebrated Cleveland inventor Garrett Morgan (1877-1963), the renowned naturalist Jared Potter Kirtland (1793-1877), and two famed nineteenth century geologists, John Strong Newberry (1822-1892) and Colonel Charles Whittlesey (1808-1886).

Lake View Cemetery has an incredible wealth of stone monuments done in a great variety of styles. Splendid examples of Neoclassical, Gothic Revival and Art Nouveau-style monuments can be found in the cemetery. Its major monuments were erected during what has been called the "golden age" of American funerary art (McDowell and Meyer, 1994, p. 183). Many of the individual monuments are well known, illustrated in works on cemetery monuments (e.g., Anonymous, 1933; Bliss, 1912), dimension stone (Dale, 1923a); and books on Cleveland.

Some monuments in the cemetery predate the establishment of the cemetery itself. The cemetery was established well after the founding of the city (Deal, 1987; Chapter 14 in Orth, 1910, v. 1), but a number of monuments and burials were moved to the cemetery from Cleveland's Erie Street (founded in 1826) and Woodland (founded in 1853) cemeteries (Lake View Cemetery files). In the first year that Lake View Cemetery was in operation, forty percent of the burials were of remains first interred in Woodland Cemetery (Karberg. 1993, p. 4).

At the time of this field trip, the cemetery is open from 7:30 AM to 5:30 PM. Before visiting, however, it is best to contact the cemetery to be sure of the opening hours. Also, the Garfield Memorial has more restricted hours and is not normally open in the late fall or winter. If you are planning to bring a group, it is necessary to request permission ahead of time. Lake View Cemetery's address is 12316 Euclid Avenue, Cleveland, Ohio 44106; its telephone number is (216)421-2665.

ARCHITECTURE, ART & HISTORY OF THE CEMETERY

Lake View Cemetery is a classic Victorian necropolis containing examples of the major, late nineteenth century, revival movements. Greek and Egyptian motifs are abundant. There are steles done in Greek fashion, mausoleums resembling GrecoRoman temples, and numerous obelisks. There are also many Gothic Revival monuments. These revival movements in the United States mirror similar movements in Great Britain (Meller, 1994). Victorian times, with their emphasis on the individual, fostered a plethora of individual memorials, many of ostentatious proportions (Newberry, 1880, p. 114; McDowell and Meyer, 1994, p. 5).

The monuments in Lake View Cemetery, like the monuments in numerous other Victorian cemeteries in the United States, reflect a growth of domestic stone quarries and the flowering of the American monument trade (McDowell and Meyer, 1994, p. 14). Indeed, a great many of the monuments in Lake View Cemetery were fabricated by the Carabelli Company, whose shop and workers were located very near the cemetery (Johns, 1991).

PHYSIOGRAPHIC AND GEOLOGIC SETTING

Lake View Cemetery straddles the Portage Escarpment, the rise that separates two physiographic provinces, the Lake Plain and the Appalachian Plateau. The escarpment and the Lake Plain can best be seen from the observation platform of Garfield Memorial. The memorial also stands on a well-known terrace, described by Newberry (1873, p. 182) as the Second Terrace, 210 feet above the Lake (an elevation of 783 ft.), and by Leverett (1901, p. 734) who notes a higer elevation (circa 823 ft.) for the "prominent terrace ... on which the Garfield monument stands." It is now known as the upper terrace (see Totten, 1982, p. 53).

The cemetery is bisected by the stream valley of Dugway Brook. Bedrock is exposed at places along the stream valley at various sites. The sequence of bedrock exposed in the cemetery consists of the Chagrin Shale and Cleveland Shale (sometimes considered members of the Ohio Shale), and the Bedford Formation. This sequence is mostly or entirely Late Devonian in age. The distribution of these rocks has been mapped by Cushing, Leverett and Van Horn (1931, Pl. 20).

The lowest layer of the rock sequence is the Upper Devonian Chagrin Shale. This gray shale is exposed along the floor and walls of the valley of Dugway Brook; it is mostly covered by vegetation elsewhere. The Cleveland Shale Member of the Ohio Shale, a fissile black shale, overlies the Chagrin. The Cleveland is distinguished by its blocky nature in outcrop. Its unweathered color is a rich black, but it weathers to a light gray with reddish iron stains. Prominent joints (cleats) can be seen in the shale alongside Dugway Brook.

The contact between the Cleveland and Bedford is gradational. The Bedford is exposed along the upper reaches of the brook, as well as along Quarry Road between the new mausoleum and the Garden Crypts. The base of the Bedford is gray shale. Here at the cemetery there are about 4 m of soft gray shale with interbedded siltstone beds and some pyritic layers. The sandstone at the top of the gray shale is known informally as the *Euclid bluestone*, and sometimes as the Euclid member of the Bedford Formation. Well known as a hard, durable stone, *Euclid bluestone* was once quarried in Newburgh and Bluestone, now parts of southeast Cleveland and South Euclid, respectively (Cushing, Leverett and Van Horn, 1931, p.107-109; Hannibal and Palermo, 1980). *Euclid bluestone* was also quarried in the cemetery and in what is now the Euclid Creek Reservation of the Cleveland Metroparks (see p. 15). *Euclid bluestone* is seldom "blue"; the name is a misnomer. The name "bluestone" originated with a variety of dense sandstone that split easily into slabs that was quarried in New York State. However the name has been applied to similar sandstones irrespective of color (Bowles, 1939, p. 97).

The strandlines (shorelines of prehistoric lakes that preceded the present Lake Erie during the Pleistocene Period) for several glacial lakes pass through the cemetery (Totten, 1982, fig. 29). These include the Middle (Whittlesey) strandline at about 720 feet elevation, the Upper III (Maumee) strandline at about 750 feet elevation, and the Upper I (Maumee) strandline at about 780 feet elevation. Water once lapped at various elevations within what is now the cemetery. Areas of the cemetery on the escarpment itself are mostly thin soils developed on bedrock. Upper elevations of the cemetery are covered by glacial till (Ford, 1987, plate). More information on the glacial geology of this area can be found in White (1982) and Ford (1987).

MORE ON CEMETERIES

For those interested in pursuing similar studies of cemeteries, Morris (1994) is a good general introduction to cemetery history and interpretation, Cvancara (1995) is a good introduction to the geology of monuments, and Sandy (1992) is a good example of a geological guidebook to a cemetery. There is also an educator 's handbook to Lake View Cemetery (Dooner and Bossu, 1990).

Lake View Stop 1. GARFIELD MEMORIAL

The Garfield Memorial is the most prominent and well-known structure in the cemetery. It towers above its surroundings, and is visible from many locations within and west of the cemetery. However, it cannot be seen from the entrances to the cemetery. Follow the signs just inside the gate to the memorial. The memorial is located in section 15 off of Garfield Road, just to the northeast of the Mayfield Road entrance to the cemetery. Completed in 1890, it is a memorial to, and the mausoleum of, James Abram Garfield (1831-1881), teacher, preacher, Civil War general, radical Republican, state legislator, U.S. congressman, and 20th president of the United States. Garfield was shot by a deluded office-seeker on July 2nd, 1881 and died on September 19, 1881 (Peskin, 1978).

Garfield was a friend of geology. At the Western Reserve Eclectic Institute (today's Hiram College) he taught a geology class that was popular despite its 5:00 AM time slot (Peskin, 1978, p. 52). Although he argued against the concept of evolution in a debate in Chagrin Falls, Ohio, in 1858 (one year before the publication of *The Origin of Species*), Garfield later changed his views (Peskin, 1978, p. 55-57).

During his legislative career, Garfield was an indefatigable and influential proponent of progressive causes, including government support of education, school libraries, and scientific research. As an Ohio congressman he argued for the need for an Ohio Geological Survey (Garfield, Collins and Ferguson, 1860; Newberry, 1870, p. 6), presenting a bill for the resumption of the state survey (Hinsdale, 1882, p. 175; Merrill, 1920, p. 399). Despite Garfield's efforts, however, the survey was not resumed till many years later. As a United States congressman, Garfield had an important role in the funding of various nineteenth century geological work in the western part of the country. He also played a key role in the establishment of the U.S. Geological Survey (Leech and Brown, 1978, p. 166-67). According to Hinsdale (1882, p. 174), Garfield "... supported every intelligent and practical scheme touching the extension of scientific knowledge or its reduction to practical uses." And scientists of the time, "especially those who were in any way serving the government, as well as the public,--geologists, botanists, astronomers, engineers, and explorers,--came to rely greatly upon him for securing the appropriations that they needed to carry on or enlarge their work" (Hinsdale, 1882, p. 174). Garfield had cordial relations with several prominent scientists, including the geologists Ferdinand Vandiveer Hayden (1829-1887) and John Wesley Powell (1834-1902). Garfield was interested in and knowledgeable about geology and other scientific topics. He would visit the Smithsonian and attend scientific lectures by geologists and others in Washington (Brown and Williams, 1967-81). Garfield was also cognizant of his key role in the support of geological work.

While chairman of the House Appropriations Committee in 1874, Garfield prompted Powell to write a popular account of his exploration of the Grand Canyon and environs. In a later, enlarged edition of that work, Powell explained that Garfield had "insisted that the history of the exploration should be published by the government, and that I must understand that my scientific work would be continued by additional appropriations only upon my promise that I would publish an account of the exploration" (Powell, 1961, p. iv). Powell's adventure filled account, which is still in print, made him famous. Powell's fame overshadowed that of previous explorers of the canyon, including that of the famous Cleveland geologist John Strong Newberry (Merrill, 1924, p. 480). Powell and Garfield had an ongoing relationship. Powell later (1878) lent his secretary, Joseph Stanley-Brown, to Garfield.

The Garfield Memorial is a splendidly eclectic structure, replete with ecclesiastical references, built in High Victorian style to house the remains of, and serve as a memorial to, the martyred president. The book published for the dedication of the memorial (Anonymous, 1890, introduction) claims, using typical nineteenth century hyperbole, that it is the "first real Mausoleum ever erected to the honor the memory of an American statesman" and only the fourth such structure (after those of King Mausoleum, Metellus, and Hadrian) ever made. While there were more than three such structures constructed before the Garfield Memorial, it is true that early grave monuments to U.S. presidents, including the mausoleum of Washington and the

tombstone of Jefferson, are quite modest. The concept of the imposing presidential sepulcher seems to have taken hold during Victorian times, a period of national imperial ambitions, not altogether unlike those which characterized the Roman empire.

This building combines several architectural traditions. It has ancient Greco-Roman designs (circular tomb, classic columns, floor mosaics) with Romanesque (doorway ornament and rose window), Gothic (pointed arches, stained glass windows) and Byzantine designs (especially the mosaics). Replete with religious references, the monument resembles a church in many ways. It is very much in the Gothic and Venetian traditions espoused by John Ruskin (1819-1900), author of the influential book, *The Stones of Venice* (1851-53).

The Garfield Monument is basically a round mausoleum, in the tradition of Rome's famous Santa Costanza (the mausoleum of Constantia) and the mausoleum of the Gordians. The monument is also very much in the tradition of Romanesque cathedrals, with the tomb of the martyr beneath the main part of the church. The tower design, especially in its original, higher, conception, and topographically high position, is reminiscent of the smaller Washington Tower in Mt. Auburn Cemetery (illustrated in Linden-Ward, 1989, fig, 10.33). Barrett (1981) has also pointed out the original design's resemblance to an Irish tower.

The exterior of the memorial, including the roof, the gargoyles, and the portal carvings, is made of Berea Sandstone, quarried in Berea, Ohio (Cleveland Stone Company, c. 1890, p. 19). The stone was probably from the McDermott quarry (Segal, 1994; the McDermott family also has a plot in the cemetery). The stone is referred to simply as Ohio stone or Ohio sandstone in many publications (e.g., McDowell and Meyer, 1994, p. 114). The Berea is an Upper Devonian or Mississippian rock unit) deposited as deltaic sand bodies. The most recent work on the Berea is that of Pashin and Ettensohn (1995). The stone used here is marked by horizontal stratification. Berea Sandstone has been widely used for structures in northern Ohio and elsewhere.

The stone of the tower is 20 to 30 cm thick and is backed with brick. The brickwork can be seen at several places inside the monument, especially along the spiral stairways leading up to the viewing platform.

There was controversy over engineering aspects of the building. One of these was over the foundation. The basal layer of stone was set on a 12-15 inch layer of "clay," rather than bedrock as originally intended (Ritchie and others, 1886). Engineers found the bedrock beneath the site to be a "soapstone shale" (Ritchie and others, 1886, p. 419). Most likely this was the gray shale of the Bedford Formation, just below the contact with the *Euclid bluestone.* There was also concern over the use of Berea Sandstone, for it was thought that this stone might not hold up well and would crumble and spall (Ritchie and others, 1886, p. 413; Barrett, 1981, p. 51). Ritchie (p. 413, 415) favored the use of granite, but sandstone was used at least in part because of its lesser expense. The cost of shipping such a large order of granite a relatively long distance would have been great.

The original winning design of the monument was a great Victorian Gothic Tower, reminiscent of other Victorian Gothic towers, such as those of the 1877 Jefferson Market Courthouse in New York City and the 1867 Templebrady Church in Crosshaven, County Cork, Ireland. The monument is scaled back from that originally planned (see original plan in Howe, 1888, p. 506, Cleveland Stone Co., 1890, p. 19; Barrett, 1981), however. The original, taller design was thought to be less in keeping with a tomb than the final, squatter design (Anonymous, 1890 p. 20).

The memorial was restored in 1984-85 with the help of a $500,000 grant from the U.S. Department of Interior (Jordan, 1985). The stone was repointed, and the old concrete decks were replaced by new concrete. A very small amount of stone, including the top two steps of the stairway leading up to the monument, was replaced. The stone was not cleaned, as it was thought that such cleaning could harm the stone.

Weathered areas of the sandstone are generally lighter in color. Original horizontal bedding is visible in these areas. Where the original bedding is beginning to show, it often forms a criss-cross pattern with the drovework (vertical grooves). Although there has been some negative comment over the change in color of the darkening of the stone over the years (Ransom, 1978, p. 145; Sande, 1987, p. 688); it has an antique look to it. There has been some stone degradation over the years. The backside of the front pillars, for instance, have weathered to a degree.

Friezes (bas reliefs) on the upper part of the entranceway show scenes in Garfield's life. They are made of terra-cotta, a baked clay. Because the friezes are so high up, it is difficult to tell that they are not carved from stone.

The basic arrangement of the interior seems to follow Roman mausoleum style: the annular vaulted walkway and the double columns are reminiscent of the circular walkway and coupled columns in Rome's Santa

Costanza . The interior, Gothic revival, design of the memorial closely resembles the interior, especially the apse, of St. Fin Barre's Cathedral in the city of Cork, Ireland (Barrett, 1981, p. 53, fig. 19). St. Fin Barre is a well known Gothic Revival cathedral, constructed in the 1860s and 70s. It also bears some resemblance to George Gilbert Scott's highly influential Albert Memorial (1863-72) in London.

The interior of the memorial, unlike the exterior, is marked by the use of stones of many colors. This polychromatic use of stone has its precedent in the use of stone in Rome during Imperial times, beginning with Augustus (Wilson, 1986, p. 772-3; Penny, 1993, chapter 70). The Victorian Gothic movement also favored the use of polychromy (Dixon and Muthesius, 1978, p. 22). The eighteenth and nineteenth century Greek revival movement, however, favored white stone. Thus the dedication book for the Garfield Memorial (Anonymous, 1890) indicated that there was some sentiment against the use of color in memorials. The Garfield Memorial, like the earlier Albert Memorial in London (see Robinson, 1987) makes use of polychromatic stone.

The stone mosaic flooring of the entrance vestibule and the rotunda is done in Greco-Roman style, with tesserae (small pieces of stone) made of dark yellowish orange limestone (perhaps one of the *Sienna marbles*), moderate reddish orange limestone (possibly the type known as *Red Verona marble*, a Jurassic age limestone quarried in the Verona area of Italy), green serpentinite, a black limestone (possibly *Belgian Black marble*), and a fine grained white marble. The white marble may have come from a variety of sources. Dolomite marble, because of its greater hardness, was the preferred material for this kind of use, and such material, with the same grain size as that used here, was available from New England (Dale, 1923b, p. 61). The serpentinite, a green stone whose polished variety is known as *Verde Antique* in the stone trade, may be domestic or imported from northwest Italy.

The high wainscoting of the circular isle of the rotunda is *Numidian marble* (Anonymous, 1890, p. 32; Ransom, 1978, p. 141), a type of stone quarried in northern Africa (Bowles, 1939, p. 330; McClymont, 1990), once the source of much stone for the Roman empire. "Numidian" marbles have been quarried in various places in northern Africa. The Numidian marble seen here is a pink and red breccia, that was very popular in the late 1800s and early 1900s.

The large double columns are a pink granite. They are said to be from Nova Scotia. Colonettes (thin columns) made of a gray granite rise along the inside of large columns. The colonettes are in imitation of the classic French Gothic *colonnette-en-délit*, found in the great Gothic cathedrals. The French colonettes were made of limestone cut along the bedding planes from their quarries and were considered a structural as well as decorative fixture (Scully, 1991, p. 135). The columns flanking the windows and blank windows along the outer walls of the rotunda, as well as the short colonettes on the second level of the rotunda, are a gray granite. The processional frieze circling the area just above the columns is a stone mosaic.

Steps leading up to the central, raised platform are *Tennessee marble*, limestone from the Holston Formation in eastern Tennessee. These stones represent an ancient reef tract (Walker and Ferrigno, 1973), but the fossils are difficult to see. More prominent are the dark, jagged stylolites, common and characteristic features in this stone (see Dale, 1924, p. 98-114; Bowles, 1939, p. 186). Quarry workers have traditional called stylolites "crowfoot."

Stone of the raised, central platform is said to have come from France, Italy (?Yellow *Sienna*), Belgium (probably *Belgium black marble*, a limestone), and Ireland (?*Conemarra*). The round discs are most prominent. Similar discoidal designs are also found in the great churches of Rome. Originally, such discs were made by slicing columns. The green discs are made of serpentinite.

The Garfield Memorial was the most important work by its architect, George W. Keller (1842-1935). He produced many cemetery monuments during a long career (Ransom, 1977). Keller also used sandstone and terra cotta for the Soldiers and Sailors Memorial Arch (dedicated 1886) in Hartford, Connecticut (Ransom, 1977, p. 131). Keller owned a *Westerly granite* quarry in Rhode Island (Ransom, 1978 , p. 9) from which he obtained stone for a number of monuments and buildings. (See p. 14 for more on *Westerly granite*).

A marble statue of Garfield stands in the rotunda. The base of the statue does not match the pattern of the inlaid stone mosaic of the platform. Indeed, Keller did not envision a statue as part of his final plans for the structure. Thus, some drawings of the interior (Anonymous, 1890, p. 26; Ransom, 1978, p. 140) show it without a statue and without a railing at the top of the central platform. As the story goes, the statue was commissioned while Keller was in England (Ransom, 1978, p. 141) and was brought into the memorial without his support. Opinion about the statue was sharply divided. Although the dedication book for the monument (Anonymous, 1890, p. 39) called the statue the sculptor's "crowning triumph" and J. D. Cox (*in*

Anonymous, 1890, p. 54) called the statue a "sort of apotheosis of Western Reserve manhood," Keller dubbed it a "monstrosity" (Ransom, 1978, p. 141).

The prominent nineteenth century American sculptor Alexander Doyle (1857-1922) designed the statue of Garfield. It is made of white *Carrara marble*, long the most famous and sought after sculptural marble. This marble had been quarried in the mountains of the Carrara area of northern Italy since the days of the ancient Romans, and popularized by Michelangelo during the Renaissance. The use of white marble for fine sculpture spread from Italy in the sixteenth century (Penny, 1993, p. 55). Doyle had studied sculpture in Carrara, Rome and Florence (Adams, 1930) and would have been very familiar with Carrara marble which was enjoying great popularity as a statuary stone at the time. Doyle was a very prolific sculptor and his statue of Garfield is among his best known works (Adams, 1930). Like Keller, Doyle had an interest in stone quarries. Later in his life, Doyle assumed management of an *Indiana limestone* quarry in Bedford, Indiana, that he had inherited from his father (Adams, 1930).

Carrara marble formed by metamorphism at about 27 million years ago (Kligfield *in* Hannibal and Davis, 1992, p. 25) of a Jurassic age carbonate rock. Fine statuary grade marble from Carrara is fine grained, and has an even, uniformly ivory white coloration (Rockwell, 1993, p. 26-27). It has enjoyed long fame as one of the finest available marbles for carving. Some have thought that the fine size of the crystals of the calcite helped to make it a good stone for carving. Rockwell (1993, p. 23), however, doubts that grain size makes much difference. Another desirable quality of fine *Carrara marble* is its translucence; the artificial lighting inside the monument gives some idea of this property. It is likely that other statues in the cemetery are made of *Carrara marble*, as this stone is still used today for cemetery monuments (Edward Kotecki Jr, personal communication, 1995). The outdoor statues, however, have not fared well over time.

Two winding sets of stairs lead up to a large, north-facing, outdoor viewing platform. The view from the platform is well worth the climb, as it overlooks the sloping area known as the Portage escarpment. The flat Lake Plain and Lake Erie lie beyond. The tall buildings of downtown Cleveland, about 8.5 km (5.3 miles) to the northwest as the crow flies, can be seen on a clear day.

A trip to the memorial is not complete without a visit to the lower level crypt. A stairway made of a fine-grained white marble with grey blotches and streaks ("veining") leads to a circular walkway surrounding the caskets of Garfield and his wife, Lucretia. A flag is draped over Garfield's casket.

The urns contain the ashes of the Garfields' daughter Mary Garfield Stanley-Brown and son-in-law Joseph Stanley-Brown (1858-1941). Garfield's son-in-law is now best known for being Garfield's secretary, but he also played an important role in the founding of the U.S. Geological Survey. As a young man, Stanley-Brown (then Mr. Brown) joined the geological survey of the Rocky Mountain region as an unpaid substitute for a friend. The head of the survey was the famed geologist and explorer, John Wesley Powell. Stanley-Brown's unpaid position turned into a full-time job and Stanley-Brown soon became practically the secretary of Powell. This was during the time that Powell was lobbying for the organization of the U.S. Geological Survey. In order to enlist the aid of the powerful Garfield, Powell "lent" Stanley-Brown to the General in order to assist with the bill consolidating the regional geological surveys into one. This effort was successful and Stanley-Brown went on to work full time for Garfield. After Garfield's death, he organized the president's papers and then, with the help of Mrs. Garfield, went to Yale to study geology. He later wed the Garfields' daughter Mary.

Lake View Stop 2. COX AND PRENTICE MONUMENTS

Two large upright memorials sculpted in ancient Greek style stand in section 10. These 2 1/2 m tall memorial tablets honor the memory of the Mrs. J. D. Cox family and the Prentice family. Mrs. Cox's husband was a prominent Cleveland businessman noted for his introduction of various benefits for his employees (Anonymous, 1987, p. 303).

The Cox monument is designed in the form of a typical Greek grave stele of the 4th century B.C. Such Greek stele, typically fashioned out of marble, were well known in the nineteenth and early twentieth centuries for they were included in books on Greek art as well as stereographic photographs (see Linden-Ward, 1989, fig. 1.7). These ancient designs found renewed use in the nineteenth century. Following French influences, monuments in the style of Greek stele were erected in Boston's Mount Auburn Cemetery in the early 1800s (Linden-Ward, 1989, figs. 224-225). Although erected later, the Cox monument is very much in this neoclassical mode.

Like classical Greek stele, the monument is com-

posed of a rectangular tablet topped with a triangular pediment with acroteria and the figures are carved in relief. The two somber figures, a standing man presenting a box, and a seated woman, are wearing ancient garb. This monument was designed and sculpted by Edward McCartan (1879-1947) of New York City.

According to cemetery files, the monument is made of *Bethel White granite*. This is a very light gray granitic rock, quarried from a small intrusive body at East Bethel, Vermont (see map in Dale, 1924, fig. 35). Dale (p. 156) classified it as a quartz monzonite. It belongs to the New Hampshire plutonic series and is Middle Devonian in age. *Bethel White* has long been known as being one of the whitest granites available (Bowles, 1939, p. 116). Dale (1924, p. 157) found its coloration to be lighter than that of other New England "white" granites. The rock is composed chiefly of white feldspars and quartz, plus dispersed, mainly brown colored, mica. When finished with a slightly rough surface, *Bethel White*'s coloration approximates the color of the classic white marbles used by the ancient Greeks for their grave stele. Look closely at the surface of the monument and you will see the sculptor's tool marks; if polished the monument would have had a darker appearance. Because of its light color, the use of *Bethel White granite* here for a Greek style monument is singularly appropriate. McCartan felt that *Bethel White* was a very fine granite for carving that would withstand weathering (letter of Sept. 11, 1931 from Edward McCartan to Mrs, Francis F. Prentice, Board File 2342, Lake View Cemetery). This stone is a replacement stone for the original stone, which probably was made of marble.

The monument has weathered over time, however. And the minerals in this monument have weathered differently; micas are weathering more than the feldspars and quartz. Thus, when viewed up close, the memorials have a pocked appearance. Such differential weathering is not unusual. Similar preferential weathering of ferromagnesian minerals can be found in many granite monuments in the cemetery and elsewhere. Such weathering is more noticeable, however, on these lighter colored monuments.

Like the Cox monument, the nearby Prentice monument is in the form of an ancient Greek memorial tablet. It shows two women wearing ancient garb, the woman on the left holds an unidentified object somewhat resembling a musical instrument, the veiled woman on the right holds a lamp. The woman on the left may represent life; the woman on the right, mourning and death. The monument is made of a light colored granite. Inscriptions on the monument indicate that it was designed by Kenyon Cox and sculpted by H. D. Thrasher. The division of labor documented here is typical of cemetery art; seldom are monumental art works carved directly by the artist or designer. Like the Cox monument, this monument is made of a very light gray granite with prominent masses of mica that have preferentially disintegrated.

The Cox and Prentice headstones are made of a gray granite, perhaps Quincy Granite.

Lake View Stop 3. JOHN HAY MEMORIAL

A stone angel located in section 10, to the south of the large Rockefeller obelisk, honors the memory John Milton Hay (1838-1905). Hay was a multi-faceted personage. Diplomat, businessman, writer, and poet, Hay was the epitome of values held dear during the Victorian and Gilded ages in North America. He served as private secretary to Abraham Lincoln, and was offered, but declined, a similar position under Garfield (Peskin, 1978, p. 549). As secretary of state under McKinley and Theodore Roosevelt, Hay was a supporter of imperial expansion and a spokesman for the United States in the Gilded Age. Today he is probably best known in association with the "Open Door" policy and for his coauthorship of an important, 10-volume set of books on Abraham Lincoln. Hay married into the local Stone family and lived in Cleveland for a short period (1875-1886). He was a political personage of great importance, as reflected in his lengthy entry in the *Dictionary of American Biography* (Dennis, 1932). The statue of Michael the Archangel, standing in front of a rock outcrop and leaning over a stele, is said to be symbolic of Hay's life. Michael is also a prominent figure in John Milton's (Hay's namesake) *Paradise Lost*. A quote from the King James version of the Epistle of James (3:18), "The fruit of righteousness is sown in peace of them that make peace," is carved into the stele. This memorial was erected in 1915. It features a limestone statue of a muscular Michael the Archangel in sparse, but martial regalia, on a granite base. The statue is sculpted from *Napoleon Grey marble* furnished by the Tompkins-Kiel Marble Company (Anonymous, 1918). *Napoleon Grey* is a fossiliferous limestone of Mississippian age quarried near Phenix, Green County, Missouri. The statue is very light gray in color; the stone only takes on a deep gray color when polished. This stone belongs to the Keokuk or another contiguous formation (Hinchey

1946), and is notable for its fossiliferous nature and for its prominent stylolites (Hinchey, 1946, p. 23-25). Fossils are readily visible in the sculpture. They include horn corals (perhaps not the most appropriate fossils in a statue of an archangel), sea lilies, and brachiopods. *Napoleon Grey* is sawed across the natural bedding of the rock (Hinchey, 1946, p. 26) and is, therefore, typically set vertically when used for partitions (Carthage Marble Company, 1961-1970, no. 5, 1961) and has been so used for this statue. Vertical orientation of the block for the statue, however, probably has accelerated dissolution: while the entire statue shows signs of weathering, weathering has been especially noticeable along stylolitic surfaces. Because of the vulnerability of stylolitic surfaces to weathering, Dale (1924, p. 158) noted that it was best to minimize the size and number of sutures (stylolites) on exposed surfaces of monuments. He explained that clayey coatings were washed out of stylolitic surfaces, allowing acidic rain water ready access to cavities. The vertical orientation of the stylolitic surfaces of this particular monument probably adds to the problem, as acidic rainwater can easily work its way into the vertical suture areas. During winter, the water can freeze, accelerating weathering.

The distal section of the sword that projects from the right side of the statue is concrete. The statue was cleaned and chemically treated in 1994. The sword had broken and was restored earlier. Part of the Archangel's chin is missing.

The statue base is a pink, migmatitic granite, containing irregular bands of dark minerals.

The Hay monument is an example of a collaborative effort by a sculptor and an architect, both of whom were well known in their time. Such collaborations were common in the late nineteenth century (Potter and Boland, 1992, p. 12). The statue was designed by James Earl Fraser (1876-1953), a sculptor who also designed figures on the Supreme Court Building and the large bronze sword of the Second Division Memorial in Washington. The statue was actually carved, however, by the Piccirilli brothers or others. The base of the statue was designed by the architect Henry Bacon (1866-1924). Bacon had an interest in pedestals of monuments and often collaborated with sculptors (Whitaker, 1928). His most outstanding collaboration in stone, however, was the Lincoln Memorial, which he designed to house Daniel Chester French's monumental statue of Lincoln.

Lake View Stop 4. ROCKEFELLER OBELISK

The Rockefeller Obelisk, at 21 m (55.5 ft) tall, is the largest obelisk, and the second highest monument, in the Cemetery. It is located north of the Garfield Memorial. The obelisk commemorates John D. Rockefeller (1839-1937), founder of the Standard Oil Company, billionaire and one of the famed robber barons of the late nineteenth and early twentieth centuries. Employing what were then legal, if ruthless, business tactics, Rockefeller built Standard Oil into a vast conglomerate, which was later broken up into a number of smaller petroleum companies. It was due in large part to Rockefeller that Cleveland became a great refining center in the late nineteenth century.

The obelisk is said to be the largest in any American cemetery (Jackson and Vegara, 1989, p. 81). Indeed, its transport to its present location in the cemetery via horse teams and wagons damaged the cemetery's roads. The obelisk is made of the *light Barre* variety of Barre granite quarried in the Wetmore & Morse quarry (Dale, 1909, p. 69), which was located just southeast of the city of Barre, Vermont (Dale, 1909, p. 69; pl. 1). The obelisk was sandblasted in the mid-1980s in order to remove graffiti. It is fairly plain, but contains a band of carved acanthus leaves and the carved name "Rockefeller."

There are numerous obelisks in Lake View Cemetery. Indeed the number of obelisks in Victorian cemeteries is said to give these cemeteries a "bristling" appearance. Obelisks date back to the Egyptians, who produced a large number of monolithic obelisks from granitic rock. Most were erected in honor of the sun god. Interest in things Egyptian reached a peak in Imperial Rome; thus the exodus of obelisks from Egypt began during the time of the Empire (recall Anthony and Cleopatra and all that). That is why the best place to view Egyptian obelisks today is Rome, where they now grace a number of piazzas. A renewed craze for things Egyptian began with Napoleon's late eighteenth century expedition to Egypt and the subsequent publications of French archeologists. Large obelisks were again taken from Egypt in the 1800s, this time to major cities in the west. Egyptian obelisks were erected in Paris in 1833, in London in 1878, and in New York in 1881 (Habachi,1984). The Washington Monument was designed in the shape of an obelisk in 1848 (not being a monolith, it is not a true obelisk), and was finally

finished in 1885. Obelisk mania was at its height in the United States in the late nineteenth and early twentieth centuries and obelisks became immensely popular in cemeteries. While many were made of sandstone and marble, most were fashioned from granitic rocks.

The ancient Egyptians erected obelisks in pairs, but seldom are they so erected in cemeteries. An exception are the pair which flank the entrance to a mausoleum at London's Highgate Cemetery. Like those erected in most cemeteries, the obelisks of Lake View are erected as lone monuments.

Sometimes one can find dimes on the lower portion of the monument, hearkening back to Rockefeller's gesture of distributing dimes to children. So, if you come upon the monument and there are no dimes, leave one; and if there are some, and you need one, take one.

Lake View Stop 5. COLONEL CHARLES WHITTLESEY'S HEADSTONE

You will need to look closely to find the modest-sized, but strikingly handsome headstone that marks the last resting spot of Colonel Charles Whittlesey (1808-1886). Its size belies the importance of the figure it memorializes. The headstone is located in the southeast corner of Section 14, just back from Chapel Road. Whittlesey was one of northern Ohio's great naturalists. His headstone is not only one of the best documented in the cemetery, but also one of the stones most closely linked to the person it honors while that person was alive.

Whittlesey is noted for a number of achievements, including original observations of geological phenomena such as kettle holes and landslides, and his surveys of archeological sites. He also wrote an important historical work, *Early History of Cleveland, Ohio* (1867), was the first president of the Western Reserve Historical Society, explored for ore in the upper Great Lakes region, participated in geological surveys of Minnesota and Wisconsin, and served as an assistant on the first (Mather) Ohio Geological Survey (Winchell, 1889). Because Colonel Whittlesey was one of the first people to explore the old shorelines of the glacial lakes, Lake Whittlesey, one of the precursors of Lake Erie, was named in his honor (Taylor, 1897, p. 39). Fittingly, the shoreline of Lake Whittlesey passed through what is now Lake View Cemetery.

Whittlesey's headstone is a jasper metaconglomerate, that is, a metamorphosed conglomerate. This metaconglomerate includes prominent white and brick-red pebbles. Because they contrast strongly against the white matrix, the red pebbles, some of which approach 4 cm or more in length, are quite distinct. Concave depressions indicate areas where a pebble or other material has weathered from the main body of rock. The jasper metaconglomerate is derived from the Lorrain Formation of the Lake Huron region. The Lorrain Formation is Huronian, between 2.1 and 2.5 billion years old.

Whittlesey's is not the only headstone in Lake View made of this stone. The Parmellee monument and headstones, located in the north part of Section 25, just east of the path off Maple Road, are also fashioned from a similar jasper metaconglomerate. And the same type of stone is also used for the Wright monument and headstones at Oberlin's Westwood Cemetery (Hannibal, Lanier, and Stover, 1991).

The stone used for these headstones and monuments were called jasper conglomerates by George Frederick Wright (1891, p. 212-213; 1894) and others (e.g., Newberry, 1880, p. 110). These jasper conglomerates were of special interest to geologists in the late nineteenth and early twentieth centuries, especially those interested in glacial movement. (The Ohio Academy had a boulder committee!) They noted the occurrence of these stones as erratics and traced the stone back to parent outcrops in the north. Indeed, Wright (1891, p. 327; 1893) reported that some Clevelanders, including Colonel Whittlesey, brought large pieces of this attractive stone from outcrops on the north shore of Lake Huron and around the outlet of Lake Superior to their Cleveland homes for use as lawn ornaments.

The stone has weathered some over time. There are dark "lettering weathering" rims around the inscribed letters and some of the pebbles have weathered out from the matrix.

This stone makes an especially fitting tombstone for a geologist interested in glaciers. The history of this monument was documented by Henry Howe in his well known 1888 work, *Historical Collections of Ohio*. Howe had known Whittlesey for a long time, as Whittlesey had written a sketch of the geology of Ohio (Whittlesey, 1849) for Howe's 1849 volume on Ohio. According to Howe (1888, p. 523), Whittlesey's tombstone is the "small white boulder, dotted with red spots-jasper" that he observed along the path to Whittlesey's cottage in Cleveland in 1886. Whittlesey died shortly after Howe's visit, and Howe reported that "the white boulder with blushing spots that adorned the front yard of the cottage is also gone and now rests

over his burial spot in peaceful Woodlawn [sic]." The headstone seen in Lake View Cemetery more-or-less fits Howe's description. Howe described the front of the boulder as being polished, and as having Whittlesey's name carved into it. The placement of the lettering on the stone also supports this being the same stone: the name Whittlesey is more-or-less centered on the stone while the Colonel's dates are placed below. This asymmetry makes it appear that the name was added first and that the dates were added later (Philip Banks, Case Western Reserve University, personal communication, 1995). According to Howe, Whittlesey obtained this stone from the north shore of Lake Huron.

Glacial boulders are used in other places, albeit infrequently, for grave markers. Some geologists have used them as such. The most famous instance of such use is the gravestone of the famous naturalist and geologist Louis Agassiz (1807-1873). Agassiz was an early and highly influential champion of the glacial theory, that is of the concept of masses of ice spreading across the landscape, spreading erratics (Imbrie and Imbrie, 1979, Chapters 1 & 2). Early on in his career Agassiz had studied glaciers from headquarters in a hut at the Aar Glacier in the Swiss Alps. A boulder taken from the Aar Glacier in Switzerland, not far from his research station (a hut) was placed at his gravesite in Mount Auburn Cemetery in Boston (Agassiz, 1886, p. 783).

Whittlesey's cantankerous character (Merrill, 1924, p. 356) led to a number of conflicts with colleagues over the years. Early on, Whittlesey befriended a budding geologist, John Strong Newberry. He gave Newberry a number of fossil plants, one of which Newberry named after Whittlesey. Their friendship later unravelled into what has been recorded in the annals of geology as the Newberry-Whittlesey controversy (Merrill, 1920, p. 451-52). Both of these important geological figures now lie in peace in the same cemetery, albeit far from each other.

Lake View Stop 6. DUGWAY BROOK

The stream that runs through the cemetery was once known as Smith's Run, but has long been known as Dugway Brook (see, for example, Hopkins Company, 1912, Plate 36). An eastern branch of the same stream runs through Forest Hills Park, a former Rockefeller estate, just to the east of the cemetery.

Dugway Brook runs toward the cemetery in a culvert; it's upper section in Cleveland Heights has long been transformed into a storm sewer. The 1903 Euclid 15-minute USGS topographic quadrangle map shows an earlier configuration of Dugway Brook, whose two main branches originally converged just to the south of the Lake Shore railroad tracks south of the Lake. Both branches of the stream are now severely tamed.

Dugway Brook now enters the cemetery from a culvert, cascading onto sandy layers of the Bedford Formation known as *Euclid bluestone*. The stream once flowed rather freely through the cemetery itself, but in recent years, with the construction of the dam and other water control measures, the stream has been tightly constrained. Upon leaving the cemetery, at the base of what is sometimes a pond and at other times a wetland, the stream again enters a culvert flowing northward, underground, on its way to Lake Erie. Just north of Lake Erie, in Bratenahl, it again exits from a culvert. Additional details of the journey of the Dugway have been described in a delightful article by Beach (1993).

Lake View Stop 7. THE GRAVE OF JARED POTTER KIRTLAND

The monument of the famous Cleveland naturalist Jared Potter Kirtland (1793-1877), and his in-laws in the Pease family, is located near the top of the hilly area in the center of Section 13. This area can be reached from a stairway off of Detour Road. The sarcopagouslike monument is a large, two-meter-high block. The Pease side of the monument faces Detour Road; the Kirtland side faces northwest.

A biologist and medical doctor, Kirtland was an assistant in charge of zoology for the first Ohio Geological Survey (1837-38) under William W. Mather (Gehr, 1952, p. 16-18; Whittlesey, 1886). Kirtland published a checklist (1838) of Ohio animal species in the Geological Survey publications. He was a correspondent of the great naturalist and geologist Louis Agassiz (for more information on Agassiz, see information under Charles Whittlesey), and a collecting companion and correspondent of Spencer F. Baird (1823-1888), who was later to be secretary of the Smithsonian Institution. Although he was a noted local physician, natural history was always to be his chief passion. Kirtland was discouraged from doing surgery because of a fear of malpractice suits (Whittlesey, 1886, p. 78). He also a founder of the Cleveland Medical College and organized the Cleveland Academy of Science, which eventually became known as the Kirtland Society (and, which, through a tenuous link,

later became the Cleveland Museum of Natural History). Kirtland was known for his breadth of learning and for his insatiable "thirst for knowledge" (Newberry, 1886 p. 131). He published numerous scientific and popular articles and was also known as a foe of homeopathy and other quackery. He made his home in east Rockport, now Lakewood, a western suburb of Cleveland, where in 1842 he entertained the famous geologist Charles Lyell (1797-1875) (Lyell, 1845, p. 71). Kirtland was well respected by his peers. Two of his scientific contemporaries, John Strong Newberry and Colonel Charles Whittlesey, both of whose remains also reside in Lake View Cemetery, wrote necrologies of Kirtland (Newberry, 1886; Whittlesey, 1886, p. 76-81). Numerous things have been named for Kirtland; among these is Kirtland Road in the cemetery. The Kirtland Pump Station just east of downtown Cleveland is also named for him, in honor of his efforts to obtaining clean drinking water for Cleveland. More information on this important naturalist can be found in Gehr (1952), Hendrickson (1962) and Dexter (1977). Some of the specimens collected by Kirtland are preserved in the collections of the Cleveland Museum of Natural History. The Museum's scientific publication, *Kirtlandia*, is named in his honor.

The Kirtland/Pease monument is made of dark gray Quincy Granite. It is composed of white and gray feldspars, quartz, and 20% ferromagnesian minerals. The granite has various finishes. Side panels, a Greek design, and raised lettering on one side are polished. Cemetery records show that Kirtland's name was added to the monument after its erection. His name, which is engraved on the monument, stands out better than the raised, polished, lettering used for the Pease name.

The Kirtland and Pease headstones are white marble with alternating bands of light gray and medium dark gray. The marble headstones have been weathered to various degrees; the older ones generally show a greater amount of weathering.

Lake View Stop 8. THE DAM

A large dam, completed in 1978, straddles the valley of Dugway Brook towards the south end of the cemetery. The two best views of the dam are from Edgehill Road at about the midpoint of Section 8 and from the base of the dam itself, along the floodplain of Dugway Brook. The dam extends from this spot to the opposite valley wall. The 47.3 million dollar dam is 90 feet high and 520 feet wide. It is a concrete gravity dam that relies on its mass for stability.

The dam was built as part of an agreement reached in May of 1973 in Common Pleas Court in Cleveland. Flooding was especially bad on July 24, 1966 (Karberg, 1995, p. 5). A big storm hit both sides of the city on that day, dumping 1.25 in of rain on the eastern suburbs in only three hours (Anonymous, 1966). The cemetery had brought a lawsuit in 1967 against Cleveland, Cleveland Heights, and University Heights claiming that flow from storm sewers from these municipalities was causing Dugway Brook to flood (Andrzejewski, 1973; Funk, 1976). While this is undoubtedly true, it's also true that the stream was flooding its floodplain. An illustration of the dam (Anonymous, 1976) shows a large lake impounded behind the dam! More on the history of the dam can be found in Anonymous (1976, 1979). At least one owner of a plot near the dam has noted that his final resting place will be a "dam site" nearer to heaven (Hannibal and Schmidt, 1988).

The instability of the shale abutting the dam has long been a problem. Various methods have been used over the years in an attempt to stabilize the shale. Vetch was planted along the sides in 1985. A large amount of money has been spent on the dam and stream over the years (see, for instance, Thoma, 1992) and much of the upper part of the stream is lined with concrete.

Lake View Stop 9. JOHN STRONG NEWBERRY GRAVESITE

A prominent monument along Edgehill Road in the southern part of Section 2 marks the Newberry family plot. The bronze oval on the Newberry monument contains a bronze portrait of John Strong Newberry (1869-1882) Ohio's best known geologist. Newberry's early training was in medicine. He participated in many early western expeditions. Newberry was the first geologist to describe the glories of the Grand Canyon in any detail. During the Civil War he headed up part of the Sanitary Commission, an organization that eventually evolved into the Red Cross. Newberry headed the second Geological Survey of Ohio (1869-82), and simultaneously (it is hard to think of somebody trying this today!) taught at Columbia School of Mines in New York City. Newberry's official residence--and family--remained in downtown Cleveland while he maintained this dual role. This dual role did stir up some resentment and was heavily criticized by Colonel Charles Whittlesey.

Newberry was a very important scientific figure during the second half of his life. He played key roles in various scientific societies, including the Geological Society of America, and was one of the members of a National Academy of Sciences Committee which issued a report to Congress on the various geological surveys in 1878, pursuant to the formation of the U. S. Geological Survey (Marsh et al., 1878). Judged by the number and variety of things named in his honor, Newberry certainly is the most celebrated of Ohio geologists. Fossil invertebrates, vertebrates, and plants, a preglacial river that ran through Cleveland, a national monument in Oregon, and two prominences in the Grand Canyon are among the things named for him.

The Newberry family monument is made of pink Westerly granite (Lake View Cemetery records) with a steeled finish. This kind of finish, made by "ironing" the stone with steel shot, creates a texture that is in between that of hammered and polished stone (Bowles, 1939, p. 165). The stone is fine grained; most crystals are well below 1 mm in maximum diameter. Westerly granite was a monumental granite (Dale, 1908, p. 197) quarried in Westerly, Rhode Island. Westerly granite may be a quartz monzonite (see Dale, 1908, p. 191; Dale, 1923a, p. 410). John Strong Newberry's headstone is made of a fine grained granite that is very much like that used for the Newberry monument.

Lake View Stop 10. *EUCLID BLUESTONE* OUTCROPS AND OLD QUARRY AREA

Note: The old quarry area of the cemetery is only accessible with permission.)

A very fine grained, yellowish gray sandstone crops out along the north side of Quarry Road just east of the new Mausoleum. This rock layer, which is known nformally as *Euclid bluestone*, is part of the Bedford Formation. Here the rock weathers into irregularly flaggy beds.

In the past, *Euclid bluestone* has been quarried in the cemetery just west of the Garden Crypts. This quarry is seen on the 1903 Euclid 15-minute USGS topographic quadrangle map, as well as the geologic map of the Cleveland region accompanying Cushing, Leverett, and Van Horn's study of the geology of the Cleveland area (1931, Pl. 20). The quarry, active until the mid-1930s, supplied stone for the wall on the Mayfield side of the cemetery, as well as for various cemetery structures and foundations (Katherine Kohl, personal communication). There was once a stone crusher located at the quarry. Two to three inches of crushed stone was used as foundation material for monuments (two to three inches of crushed stone were typically used beneath a monument).

See p. 4 and p. 12 for more information on the bedrock in the cemetery.

EUCLID CREEK

The Euclid Creek Metropark contains beautifully exposed and easily accessible outcrops of northeastern Ohio's Devonian (or Devonomississippian) rock sequence, from the Chagrin Shale though much of the Berea Sandstone. Several of these units were named by J. S. Newberry. The section exposed here is well known in the geological literature. Prosser (1912, p. 362-376) studied this section, and the *Bluestone* quarries in this area were noted in Bownocker (1915, p. 68).

The section exposed in the park (see figure at right) is generally an upward coarsening sequence of shales, silstones, and sandstone. However, the Cleveland Shale, preserved in the middle of the sequence, may in fact represent the deepest part of the sequence.

The Chagrin Shale is a grey shale with interbedded siltstones. It contains abundant trace fossils (see Hannibal, 1996) and occasional brachiopods. Sponges were also discovered here at Euclid Creek in the 1950s. The Chagrin is an eastward shallowing shelf deposit. It represents a restricted environment of deposition (Schwimmer et al., 1987). There are several interesting faults in the Chagrin at Euclid Creek, including low angle thrust faults (Hannibal and Goslee, 1992).

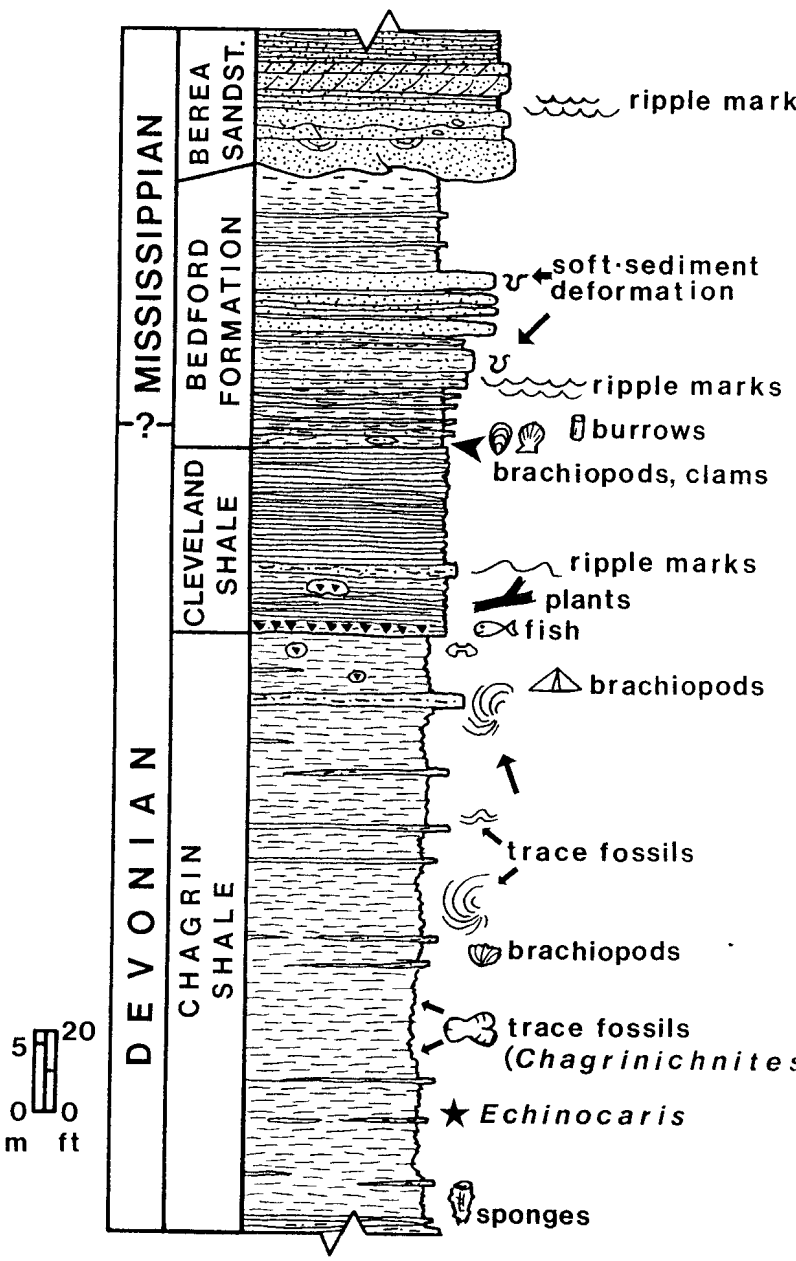
The Cleveland Shale is a classic black shale. It has a sharp contact with the underlying Chagrin Shale. The base of the Cleveland here consists of a pyrite layer, known informally as the Skiners Run pyrite bed, that contains fish bones and other material. Anita Harris (*in* Zagger and Banks, 1989) reported that conodonts in this pyrite bed belong to the *expansa* zone of the Late Famennian. Carbonized plant remains can often be seen in the lower few meters of the Cleveland at Euclid Creek.

The contract between the Cleveland Shale and the overlying Bedford Formation is gradational. Invertebrate body fossils are much more abundant and more easily seen in the lower part of the Bedford Formation than in the underlying Cleveland Shale.

The Bedford Formation consists of several rock types. The lowest part of the unit is shale interbedded with siltstones. The mid part of the unit is composed of sandstones and siltstones. Soft-sediment deformation features and ripple marks are common in this interval, known informally as the *Euclid bluestone*. Gray shales occur above the bluestone and the last couple meters or so of the unit consists of red shale.

Little remains of the famous old bluestone quarries at this location; most of the quarried areas were filled in. There is a iron ring embedded into a large piece of sandstone located near the quarry area parking lot that probably dates to the quarrying era, however.

The contact between the Bedford and overlying Berea Sandstone is unconformable. The base of the Berea is faulted, and this sandstone contains various kinds of cross bedding, ripple marks, and microfaults. The latest work on the unit is that of Pashin and Ettensohn. (1995).



Measured section of rocks in Euclid Creek Metropark.

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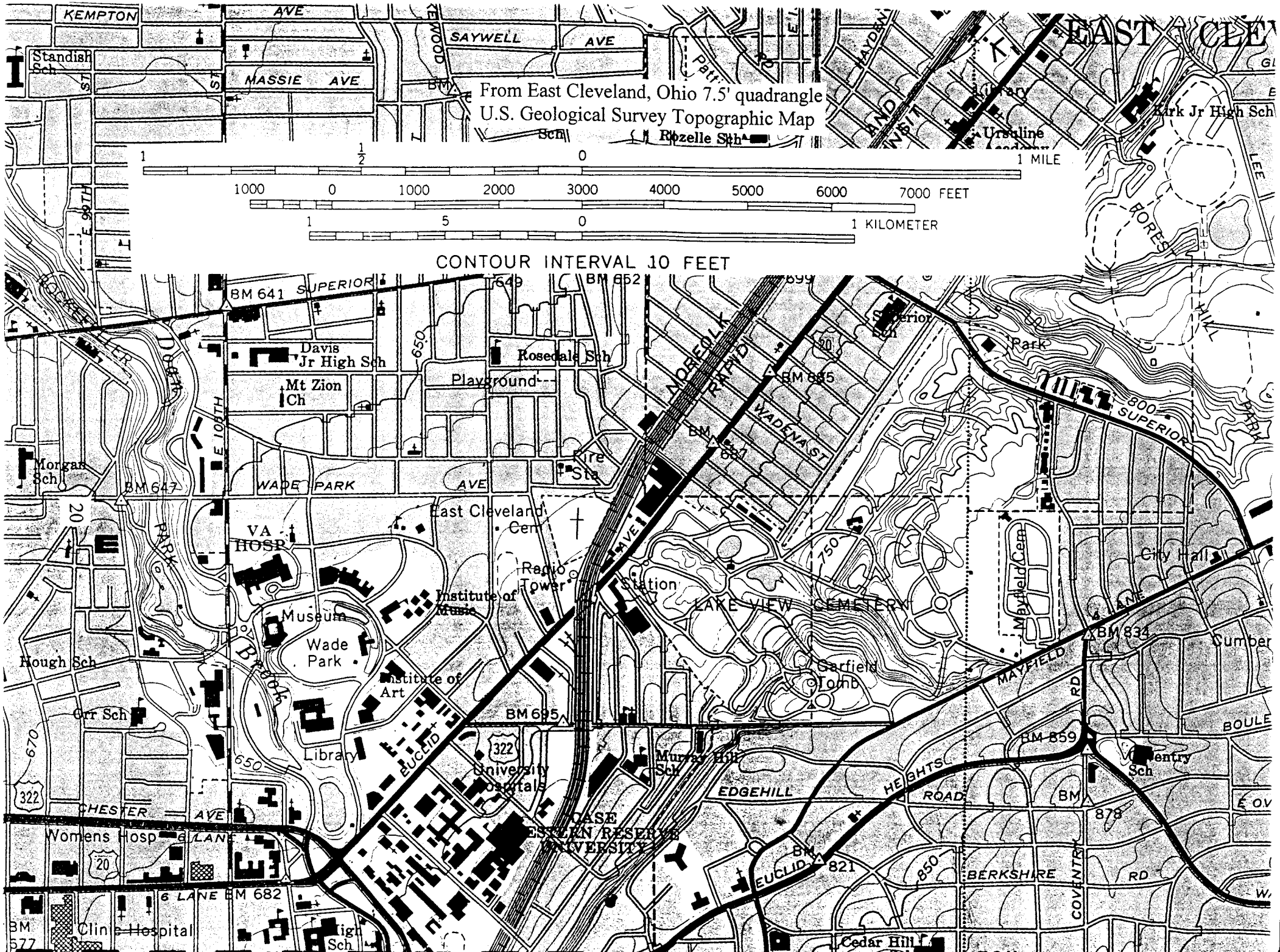
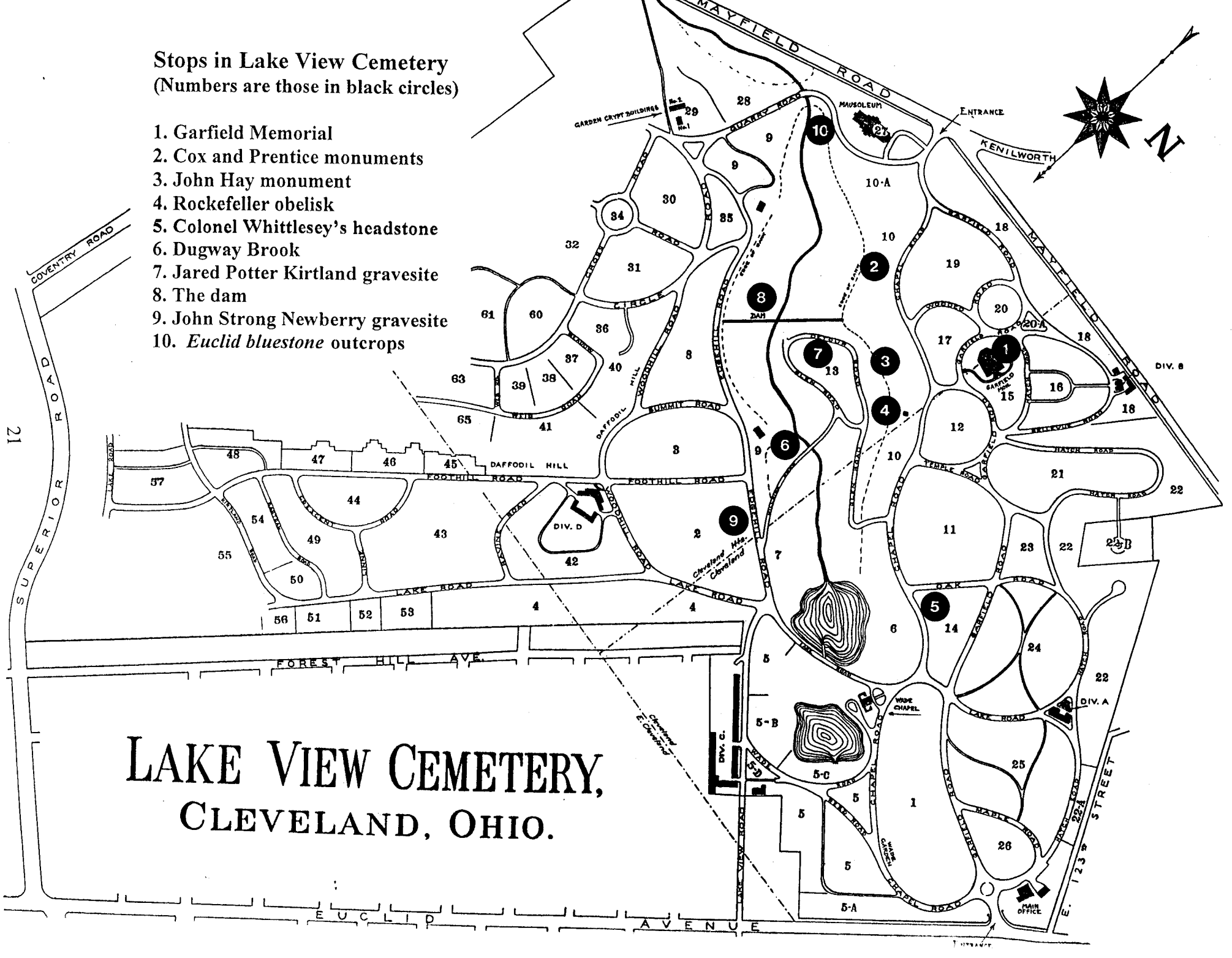
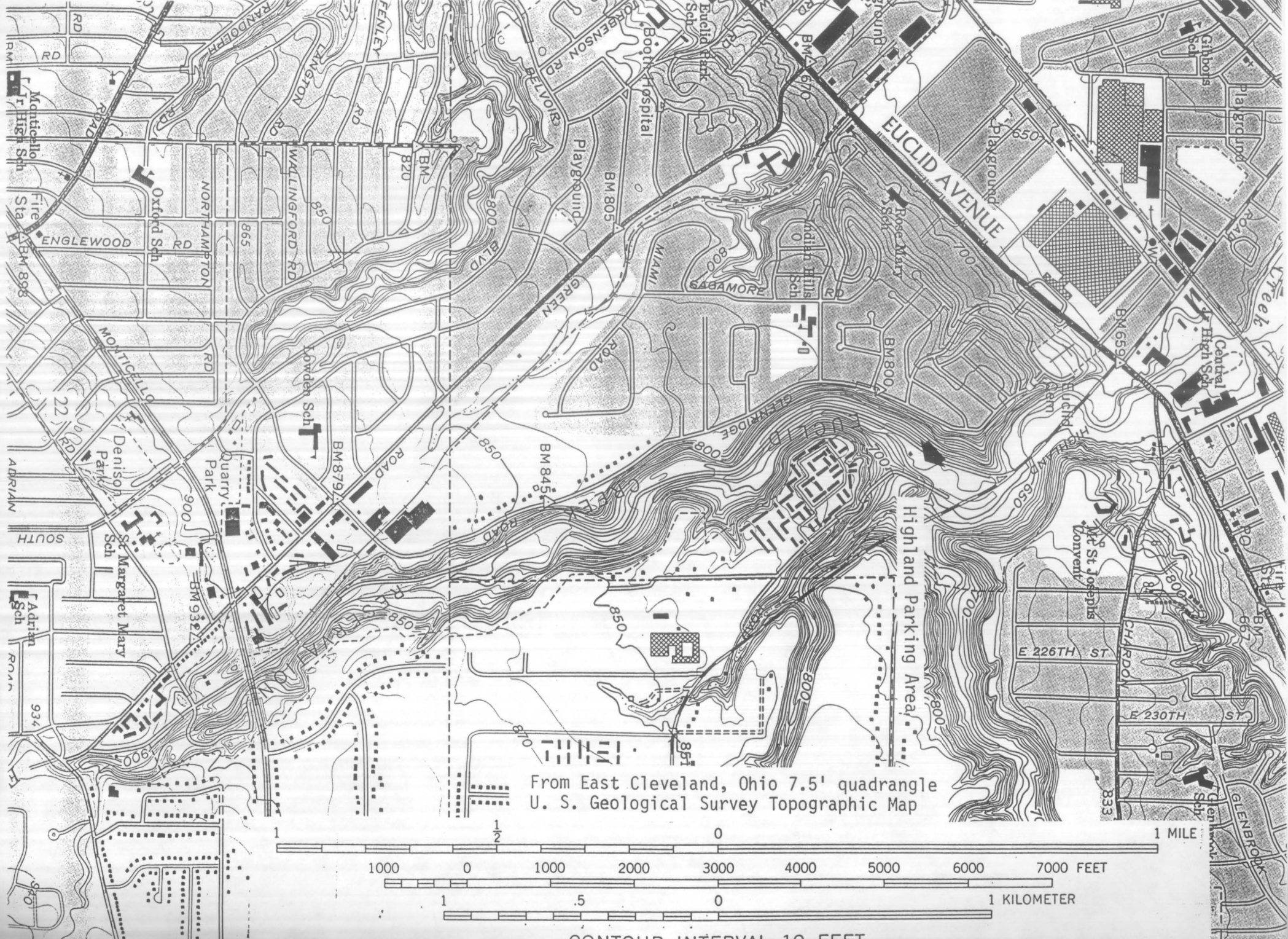

From East Cleveland, Ohio 7.5' quadrangle
U.S. Geological Survey Topographic Map
1 MILE
7000 FEET
1 KILOMETER
CONTOUR INTERVAL 10 FEET
KEMPTON AVE
SAYWELL AVE
MASSIE AVE
Standish Sch
Rozelle Sch
Kirk Jr High Sch
Ursuline
Library
EAST CLE
BM 641
SUPERIOR
Davis Jr High Sch
Mt Zion Ch
Rosedale Sch
Playground
BM 652
NORFOLK RAPID
BM 685
WADENA ST
Superior Sch
Park
800 SUPERIOR
Morgan Sch
BM 647
WADE PARK AVE
East Cleveland Cem
VA HOSP
Radio Tower
Station
LAKE VIEW CEMETERY
Mayfield Cem
City Hall
Museum
Wade Park
Institute of Music
Institute of Art
Hough Sch
Orr Sch
Library
BM 695
University Hospitals
Murray Hill Sch
Garfield Tomb
MAYFIELD RD
BM 834
BM 859
Coventry Sch
EDGEHILL ROAD
HEIGHTS
CHESTER AVE
Womens Hosp
CASE WESTERN RESERVE UNIVERSITY
BM 878
BM 821
EUCLID
BERKSHIRE RD
COVENTRY
6 LANE
BM 682
Cline Hospital
Cedar Hill
322
20
670
650
750
850

Stops in Lake View Cemetery
(Numbers are those in black circles)

1. Garfield Memorial
2. Cox and Prentice monuments
3. John Hay monument
4. Rockefeller obelisk
5. Colonel Whittlesey's headstone
6. Dugway Brook
7. Jared Potter Kirtland gravesite
8. The dam
9. John Strong Newberry gravesite
10. *Euclid bluestone* outcrops



LAKE VIEW CEMETERY,
CLEVELAND, OHIO.


Highland Parking Area
EUCLID AVENUE
ENGLEWOOD RD
NORTHAMPTON RD
WALLINGFORD RD
MONTICELLO RD
GREEN ROAD
SYCAMORE RD
GLENRIDGE ROAD
E 226TH ST
E 230TH ST
CHARDON RD
ADRIAN ROAD
SOUTH
Monticello Jr High Sch
Fire Sta
Oxford Sch
Lowden Sch
Quarry Park
Denison Park
St Margaret Mary Sch
Adrian Sch
Booth Hospital
Euclid Park Sch
Playground
Midlothian Hills Sch
Rose Mary Sch
Central High Sch
Mt St Josephs Convent
Glenbrook Sch
Gibbons Sch
BM 820
BM 805
BM 800
BM 659
BM 879
BM 845
BM 938
BM 898
BM 934
From East Cleveland, Ohio 7.5' quadrangle
U. S. Geological Survey Topographic Map
1 1/2 0 1 MILE
1000 0 1000 2000 3000 4000 5000 6000 7000 FEET
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CONTOUR INTERVAL 10 FEET

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The Cleveland Museum of Natural History